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(54) exhaust fume-catalyst

(57) the invention involves an exhaust fume-catalyst with a casing, a monolith stored in the casing and one between casings and monoliths arranged mineral fiber mat. The mineral-fibers are connected by an elastic binder together as well as are embedded in a matrix from such a binder and point out following composition (wt.%) on:

Al_2O_3	0-99%
SiO_2	1-99.8%
B_2O_3	0-30%
Alkali-Oxide	0-50%
Alkaline Earth-Oxide	0-50%
Iron-Oxide	0-15%
Titanium-Oxide	0-15%

Description

The invention involves an exhaust fume-catalyst for motor vehicles. Such exhaust fume-catalysts show a casing, in which a ceramic catalyst-body, a monolith, is stored. In one between the casing and the peripheral surface of the monolith arranged split-area is arranged a storage-mat. Many times so-called expanding or expansion mats application, that also in the hot operation-condition of the exhaust fume-catalyst, in which the split-area is widened accordingly between casings and monolith, another sufficient mounting or the monoliths guarantees. These storage-mats contain expanding mica, that changes with the operation-temperatures of the catalyst to an expanded condition. By it, the warming condition compensates the split-widening complication.

Storage-mats also find application, that contains no expanding mica, however.

Such storage-mats practice big elastic backpressure on the peripheral surface of a monolith as well as the inside-peripheral-surface of the casing of the exhaust fume-catalyst enough from itself from, so that also in the hot operation-condition and with corresponding enlarged split-area between monolith and casings a sufficient storage of the monolith is guaranteed. The fibers of these mats consist of mineral materials, that one opposite the materials more conventional, in source-mats, fibers would use an elevated separate elasticity. Such fibers are alumina-fibers for example, that 95% alumina and if necessary usual additives can contain. Fibers, that an also sufficient own-elasticity and stability show, consist approximately of a mixture from alumina and silica. They contain approximately 75 wt. for example % alumina and approximately 25 wt.% silica with which usual additives can be existing. About the necessary backpressure in the split-area intermediate a monolith and a catalyst-casing, to achieve, a relatively big fiber-quantity must be installed under initial tension into the split-area. The mats are thicker than it in the unconnected condition about a multiple the opening of the corresponding split-area. The usual mats commonly used in unconnected condition are approximately 10 cm thick, whereas the opening is usually in the amount of 6-8mm. Until now, such mats were packed in PE-foil and through sewing on a height from some centimeters compressed. But also in this condition the mats are still to be handled heavily. Especially the PE-wrapping can insert itself at two flat catalyst-casings into the separation-opening of the casing-half exterior and can hinder their bonding.

A task of the invention is it therefore, to propose an exhaust fume-catalyst, with which the assembly is relieved. To the solution of this task becomes appropriate Claim 1, to connect the mineral-fibers with an elastic binder as well as to embed into a matrix of such a binder, proposed. This way, mats can have the opening of approached thickness with one that is essentially simpler to handle as well as to install. With the final mounting, they become then in accordance with the opening compressed and lies in the split-area under initial tension one. That on the monolith-peripheral surface and the casing of practiced backpressure is evoked

with it both through the elastic binder as well as through the fibers themselves. A suitable binder is an acrylic-latex-binder. Other polymer-binders can also be put in however.

Suitable mineral-fibers are fibers, that one or several that in claim 1 named components contains. In the case of several components, it is about multi-material mixed oxide system.

In exhaust fume-catalysts for gas-motors prevails usually far above from lying 500°C temperatures. Under these conditions, the elastic polymer-binders burn, like for example acrylic-latex-binders practically remains free. The to the mounting of the monolith necessary backpressure are managed exclusively by the own-elasticity of the fibers then.

In the case of diesel engines, high temperatures are not at all reached such however. In the middle-load-range of a diesel engine, the exhaust fume-temperatures lie only approximately between 220°C and 300°C. With these temperatures would not burn approximately one acrylic-latex-binder remains freely, but charring and with it hardens. The separate elastic patterns of the mat-system would be changed by it so, that a certain mounting of the monolith would be guaranteed no longer. Comes there, that the thickness of the in such a way hardened storage-mat would be reduced by the radial-vibrations of the monolith at the vehicle-operation by compression.

Going out from these observations likes to become Claim 3, to use a binder, proposed that is constant with the named lower temperatures or disintegrates itself without hardening. I.e., that the binder with the prevalent temperatures either retains its elasticity as well as softens, itself however not under hardening disintegrates. This way the own-elasticity is not influenced the fibers as well as the mineral-fiber-mat as total practically. It retains their clamping action evoked through elastic backpressure on the monolith. In accordance with the invention, it can also be put in binder, that disintegrates itself with the prevalent temperatures in the method-load-area of a diesel engine, without hardening. Such a picture exists from a silicone-material for example. It is here about an organic compound broadly. With the first with relatively high temperatures taking place, thermal decomposition becomes the organic groups under silicon dioxide formation splitting off. This doesn't lead to an induration of the binder as well as the storage-mat however.

Patent-claims

1. Exhaust fume-catalyst with

- a casing,
- a monolith stored in the casing and
- one between casings and monoliths arranged mineral fiber mat,

through it marked, that the mineral-fibers through an elastic binder middle together is connected as well as is embedded in a matrix from such a binder and following composition (wt.%) shows:

Al_2O_3	0-99%
SiO_2	1-99.8%
B_2O_3	0-30%
Alkali-Oxide	0-50%
Alkaline Earth-Oxide	0-50%
Iron-Oxide	0-15%
Titanium-Oxide	0-15%

2. Exhaust fume-catalyst after claim 1, through it marked, that the binder is an acrylic-latex-binder.

3. Exhaust fume-catalyst after claim 1, through it marked, that the binder is constant with the operation-temperatures of the exhaust fume-catalyst or disintegrates itself without hardening.

4. Exhaust fume-catalyst after claim 2, through it marked, that the binder is an organic compound.

5. Exhaust fume-catalyst after claim 2, through it marked, that the binder is a silicone.

6. Exhaust fume-catalyst after one of the claims 1 to 5,

through it marked, that that the fibers of the storage-mat too approximately 95 wt.% from alumina exists.

7. Exhaust fume-catalyst after one of the claims 1 to 5,

through it marked, that the fibers of the storage-mat too approximately 75 wt.% from alumina and too approximately 25 wt.% silica exists.